Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

1. (currently amended)   A computer-implemented process for creating an entity that satisfies a predetermined design requirement that at least one characteristic is not in a reference structure, the process comprising:

initializing a plurality of candidate entities and an iteration count with a predetermined value; ~~and~~

performing iterative <u>genetic programming</u> operations ~~via one or more genetic programming operations~~, each iterative <u>genetic programming</u> operation including<u>:</u>

comparing each of the plurality of candidate entities with the reference structure to obtain an isomorphism value for each candidate entity, the isomorphism value representing a dissimilarity between the respective candidate entity and the reference structure,

determining a fitness value for each of the candidate entities based on a compliance with the predetermined design requirement and the isomorphism value of the respective candidate entity,

selecting at least one candidate entity from the plurality of candidate entities that has a fitness value exceeds a predetermined threshold,

creating at least one new candidate entity by creating a variation in the selected at least one candidate entity[[,]] if the selected at least one candidate does not satisfy the predetermined design requirement or a number of iterative operations has not reached the predetermined value of the iteration count, wherein the at least one new candidate is used as one of the candidate entities for a next iteration, and

terminating the iterative operations if the selected at least one candidate satisfies the predetermined design requirement or a number of iterative operations has reached the predetermined value of the

iteration count, wherein at least one of the selected candidate entities is used to design an end-result structure in view of the predetermined design requirement, wherein the end-result structure does not possess key characteristics of the reference structure; and updating the iteration count at the end of each iterative genetic programming operation.

2.   (Original)   The process defined in Claim 1 wherein creating at least one new candidate entity comprises mutating the at least one candidate entity.

3.   (Original)   The process defined in Claim 2 wherein selecting the at least one candidate entity is performed by simulating annealing.

4.   (Previously Presented)   The process defined in Claim 2 wherein selecting at least one candidate is performed by hill climbing.

5.   (Original)   The process defined in Claim 1 wherein the at least one candidate entity is a member of a population of entities.

6.   (Original)   The process defined in Claim 5 wherein creating at least one new candidate entity comprises performing a crossover operation among a group of candidate entities, the group of entities comprising the selected entity and at least one other entity from the population, the at least one new coordinate entity created by crossover comprising at least a portion of the selected entity and at least a portion of that at least one other entity.

7. – 11.   (Cancelled)

12.   (Original)   The process defined in Claim 1 wherein creating at least one new candidate entity comprises performing an architecture-altering operation involving at least one internally invokable sub-entity of the at least one selected entity.

13. (Original) The process defined in Claim 1 further comprising creating the at least one candidate entity by a random process.

14. (Previously Presented) The process defined in Claim 1 further comprising supplying, from an external source, at least one candidate entity partially satisfying the predetermined design requirement which includes a characteristic of the reference structure.

15. (Currently Amended) The process defined in Claim 1 further comprising: ~~wherein whether the selected candidate entity more closely satisfies the design requirement is ascertained by~~ evaluating the selected at least one candidate entity by simulating the selected at least one candidate entity to ascertain whether the selected at least one candidate entity more closely satisfies the design requirement.

16. (Currently Amended) The process defined in Claim 1 further comprising: ~~wherein whether the selected candidate entity more closely satisfies the design requirement is ascertained by~~ evaluating the selected at least one candidate entity by observing a physical realization representing the selected at least one candidate entity to ascertain whether the selected at least one candidate entity more closely satisfies the design requirement.

17. (Original) The process defined in Claim 1 wherein the candidate entity conforms to a constrained syntactic structure.

18. (Original) The process defined in Claim 1 wherein the candidate entity comprises an electrical circuit.

19. (Original) The process defined in Claim 1 wherein the candidate entity comprises a controller.

20. (Original) The process defined in Claim 1 wherein the candidate entity comprises an antenna.

21. (Original) The process defined in Claim 1 wherein the candidate entity comprises a mechanical system.

22. (currently amended) A computer system, comprising:

a processor; and

a memory coupled to the processor for storing computer executable instructions, which when executed from the memory, cause the processor to perform a process for creating an entity that satisfies a predetermined design requirement that at least one characteristic is not in a reference structure, the process comprising:

initializing a plurality of candidate entities and an iteration count with a predetermined value, ~~and~~

performing iterative <u>genetic programming</u> operations ~~via one or more genetic programming operations~~, each iterative <u>genetic programming</u> operation including<u>:</u>

comparing each of the plurality of candidate entities with the reference structure to obtain an isomorphism value for each candidate entity, the isomorphism value representing a dissimilarity between the respective candidate entity and the reference structure,

determining a fitness value for each of the candidate entities based on a compliance with the predetermined design requirement and the isomorphism value of the respective candidate entity,

selecting at least one candidate entity from the plurality of candidate entities that has a fitness value exceeds a predetermined threshold,

creating at least one new candidate entity by creating a variation in the selected at least one candidate entity[[,]] if the selected at least one candidate does not satisfy the predetermined design requirement or a number of iterative operations has not reached the predetermined value of the iteration count, wherein the at least one new candidate is used as one of the candidate entities for a next iteration, and

terminating the iterative operations if the selected at least one candidate satisfies the predetermined design requirement or a number of iterative operations has reached the predetermined value of the iteration count, wherein at least one of the selected candidate entities is used to design an end-result structure in view of the predetermined design requirement, wherein the end-result structure does not possess key characteristics of the reference structure; and

updating the iteration count at the end of each iterative genetic programming operation.

23. (Previously Presented) A machine-readable storage medium having stored thereon executable code which causes a machine to perform a process, for creating an entity that satisfies a predetermined design requirement that at least one characteristic is not in a reference structure, the process comprising:

initializing a plurality of candidate entities and an iteration count with a predetermined value; and

performing iterative genetic programming operations via one or more genetic programming operations, each iterative genetic programming operation including:

comparing each of the plurality of candidate entities with the reference structure to obtain an isomorphism value for each candidate entity, the isomorphism value representing a dissimilarity between the respective candidate entity and the reference structure,

determining a fitness value for each of the candidate entities based on a
compliance with the predetermined design requirement and the
isomorphism value of the respective candidate entity,

selecting at least one candidate entity from the plurality of candidate
entities that has a fitness value exceeds a predetermined threshold,

creating at least one new candidate entity by creating a variation in the
selected at least one candidate entity[[,]] if the selected at least one
candidate does not satisfy the predetermined design requirement or
a number of iterative operations has not reached the predetermined
value of the iteration count, wherein the at least one new candidate
is used as one of the candidate entities for a next iteration, and

terminating the iterative operations if the selected at least one candidate
satisfies the predetermined design requirement or a number of
iterative operations has reached the predetermined value of the
iteration count, wherein at least one of the selected candidate
entities is used to design an end-result structure in view of the
predetermined design requirement, wherein the end-result structure
does not possess key characteristics of the reference structure; and
updating the iteration count at the end of each iterative genetic programming
operation.